

What is claim d is:

1. In a tubular container transport apparatus for use during the production of filled tube products, wherein said transport apparatus includes spaced apart upper and lower platforms moveably mounted relative to one another, a plurality of tube holders supported by said upper platform, a drive motor for moving the upper and lower platforms relative to one another into indexed positions, and an unload station disposed on said base platform, wherein said unload station includes a mounting plate and an associated ejector rod that is operative, when a tube holder carrying a filled tube product is indexed into an unload position above said base platform, to travel upwardly through a bottom of said tube holder to eject the filled tube product out of said tube holder for collection, the improvement comprising:

a hold down assembly disposed proximately to said ejector rod and adapted to be magnetically interfaced between said base platform and said tube holder as said tube holder is indexed into the unload position, said hold down assembly comprising a lower piece seated on said mounting plate and an upper piece movably mounted to said lower piece and adapted to magnetically interact with a bottom of said tube holder, thereby to retain said tube holder in registered alignment relative to said ejector rod during ejection of the filled tube product.

2. The improvement according to claim 1 wherein said lower piece is magnetically seated on said mounting plate.

3. The improvement according to claim 2 wherein said mounting plate is a metallic member and said lower piece includes a plurality of magnetic elements for magnetically coupling to said mounting plate.

4. The improvement according to claim 3 wherein each of said magnetic elements is a neodymium disc.

5. The improvement according to claim 1 wherein a lower portion of said tube holder includes a central opening through which said ejector rod travels during ejection of the filled tube product and a metallic annular ring surrounding said central opening, and wherein the upper piece of said hold down assembly includes a plurality of magnetic elements for interacting with said metallic annular ring along magnetic lines of force.
6. The improvement according to claim 5 wherein said upper piece includes an annular end cap which supports said magnetic elements.
7. The improvement according to claim 6 wherein each of said magnetic elements associated with said upper piece is a neodymium disc.
8. The improvement according to claim 1 wherein said upper and lower pieces are telescopically mounted to one another.
9. The improvement according to claim 8 wherein each of said upper and lower pieces is generally cylindrical in configuration, and wherein said upper piece is telescopically received within said lower piece.
10. The improvement according to claim 9 wherein said upper piece includes an annular end cap which supports a plurality of magnetic elements.
11. The improvement according to claim 10 wherein each magnetic element is a neodymium disc.
12. The improvement according to claim 1 wherein said upper and lower pieces are movably mounted relative to one another whereby height of said hold down assembly can be selectively adjusted.
13. The improvement according to claim 12 including a locking structure for retaining said upper and lower pieces in a selected locked position.

14. The improvement according to claim 1 wherein said hold down assembly is removably seated on said mounting plate and is constructed, in the event of a collision with said tube holder, to break away from said mounting plate without damaging said ejector rod.

15. The improvement according to claim 14 wherein each of said upper and lower pieces is generally cylindrical in configuration and includes rotatably aligned, slotted channels facing in an upstream direction so that, when a collision causes said hold down assembly to break away from said mounting plate, said ejector rod passes through the aligned slotted channels and avoids contact with said hold down assembly.

16. A hold down assembly for use in a tubular container transport apparatus during the production of filled tube products, wherein said transport apparatus includes spaced apart upper and lower platforms moveably mounted to one another, a plurality of bored tube holders each supported by said upper platform and having a metallic base, a drive motor for moving said upper and lower platforms relative to one another into indexed positions, and an unload station associated with said base platform which includes a mounting plate and an associated ejector rod, said ejector rod being operative when a tube holder carrying a filled tube product is indexed into an unload position above said base platform to travel upwardly through the tube holder to eject the filled tube product out of said tube holder, said hold down assembly comprising:

- a. a lower piece adapted to be removably seated on said mounting plate;
- and
- b. an upper piece movably mountable to said lower piece and adapted to magnetically interact with the metallic base of said tube holder as said tube holder is

indexed into the unload position, thereby to retain said tube holder in registered alignment relative to said ejector rod during ejection of the filled tube product.

17. A hold down assembly according to claim 16 wherein said upper and lower pieces are telescopically mounted to one another.

18. A hold down assembly according to claim 17 wherein each of said upper and lower pieces is generally cylindrical in configuration, with said upper piece being telescopically received within said lower piece.

19. A hold down assembly according to claim 18 wherein said upper piece includes an annular end cap provided with a plurality of first magnetic elements operative to interact with the metallic base of said tube holder along magnetic lines of force.

20. A hold down assembly according to claim 19 wherein said lower piece includes a plurality of second magnetic elements for magnetically coupling said lower piece to said mounting plate.

21. A hold down assembly according to claim 20 wherein said first magnetic elements are circumferentially distributed about a central longitudinal axis of said upper piece, and wherein said second magnetic elements are circumferentially distributed about a central longitudinal axis of said lower piece.

22. A hold down assembly according to claim 18 wherein said lower piece has an associated lower piece sidewall which extends around a majority of a circle to form a lower piece slotted channel extending between opposed end walls thereof, and wherein said upper piece has an associated upper piece sidewall having an upper piece slotted channel formed therethrough which is configured as an archway.

23. A hold down assembly according to claim 22 wherein said mounting plate includes an elevated alignment notch facing in an upstream direction on the base

platform, and wherein said lower piece slotted channel is sized and adapted to accommodate said alignment notch thereby to rotatably orient said lower piece slotted channel in the upstream direction.

24. A hold down assembly according to claim 23 wherein said upper and lower pieces are adapted to be movably mounted to one another at a selected telescopic height with said upper and lower slotted channels in radial alignment with one another.

25. A hold down assembly according to claim 24 including a locking structure for retaining said upper and lower pieces at the selected telescopic height.

26. A hold down assembly according to claim 25 wherein said locking structure includes a threaded bolt extending radially outwardly from said upper piece sidewall through an aperture formed through said lower piece sidewall, and a locking handle threadedly engaging said bolt.

27. A hold down assembly according to claim 16 wherein said upper piece is telescopically mounted to said lower piece, and including a locking structure for selectively mounting said upper and lower pieces at a desired telescopic height.

28. A hold down assembly according to claim 27 wherein said upper piece includes a plurality of first magnetic elements for magnetically interacting with the metallic base of said tube holder along magnetic lines of force, and wherein said lower piece includes a plurality of second magnetic elements for magnetically coupling to said mounting plate.

29. In a tubular container transport apparatus for use during the production of filled tube products, wherein said transport apparatus includes spaced apart upper and lower platforms mounted for relative movement, a plurality of circumferentially distributed tube holders supported by said upper platform, a drive motor for moving

said upper and lower platforms relative to one another into indexed positions, and an unload station associated with said base platform which includes a metallic mounting plate and an associated ejector rod that is operative, when a filled tube product is indexed into an unload position above said base platform, to travel upwardly from a retracted position to an extended position to eject the filled tube product out of its associated tube holder for collection, the improvement comprising a method of ejecting the filled tube product from said tube holder with a reduced risk of dislodgment of said tube holder from the upper platform, said method comprising:

- a. indexing said upper platform so that the tube holder carrying said filled tube product is advanced toward the unload station;
- b. magnetically urging said tube holder into the unload position wherein said tube holder is placed in registered, alignment centrally above said ejector rod;
- c. magnetically retaining said tube holder in the unload position;
- d. actuating said ejector rod whereby said ejector rod travels upwardly toward the extended position and through said tube holder to eject said filled tube product therefrom; and
- e. allowing said ejector rod to return to the retracted position.

30. A method according to claim 29 comprising thereafter indexing said upper platform so that said tube holder is urged out of registered, alignment centrally above said ejector rod.